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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/991,372	11/13/2001	Victor Demjanenko	042159.0201	2575

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EXAMINER
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WARE, CICELY Q

ART UNIT	PAPER NUMBER
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2634

DATE MAILED: 02/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/991,372

Applicant(s)

DEMJEANENKO ET AL.

Examiner

Cicely Ware

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2634

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 13 November 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-13 is/are rejected.
- 7) ☒ Claim(s) 2 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 November 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Specification***

1. The disclosure is objected to because of the following informalities:
  - a. Pg. 1, line 19, applicant uses the phrase "this require very little". Examiner suggests using "this requires very little" for clarification purposes.
  - b. Pg. 4, lines 14, 22, 30, applicant has displaced equation number references "(10)",  
"(13)", "(15)". Examiner suggests applicant correct all instances for clarification purposes.
  - c. Pg. 4, line 24, applicant uses the phrase "it is easily shown the S11, S12". Examiner suggests applicant use "it is easily shown that S11, S12" for clarification purposes.
  - d. Pg. 5, line 22, examiner suggests applicant re-write this line for clarification purposes.

Appropriate correction is required.
2. The specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claim 7 is rejected under 35 U.S.C. 102(b) as being anticipated by How (US Patent 5,396,518).

With regard to claim 7, How discloses in (Fig 1) a transmitter for a communication system, comprising: at least one processor (14, 20); and storage media (28) coupled to the at least one processor and having stored therein programming instructions for mapping a data stream to symbols of a symbol constellation to produce a symbol stream for transmission, wherein the symbol constellation comprises a plurality of constituent constellations each having independent I and Q mapping, and wherein mapping the data stream to symbols of the symbol constellation comprises selecting constituent constellations and selecting I and Q values within the selected constituent constellations in accordance with the data stream (col. 1, lines 5-41, col. 5, line 68, col. 6, lines 1-2, 7-15, 38-58).

5. Claims 8-11 are rejected under 35 U.S.C. 102(b) as being anticipated by Ramaswamy (US Patent 5,966,412).

(1) With regard to claim 8, Ramaswamy discloses in (Fig. 1) a method in a receiver (130) of a communications system, comprising: receiving a modulated signal (118) representing a symbol stream generated by mapping (116) a transmit data stream

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to symbols of a symbol constellation; demodulating the signal (142); and generating a received data stream from the demodulated signal, wherein the symbol constellation comprises a plurality of constituent constellations each having independent I and Q mapping, and wherein generating the received data stream comprises: applying the demodulated signal (142) to a plurality of decoders (146, 148, 170), each of the decoders providing decoding with respect to one of said constituent constellations; and determining symbols of the symbol stream from outputs of the decoders (col. 1, lines 6-31, col. 2, lines 22-27, col. 4, lines 5-26, 43-46, col. 7, lines 8-22).

(2) With regard to claim 9, claim 9 inherits all the limitations of claim 8.

Ramaswamy further discloses wherein the constituent constellations are square (col. 1, lines 32-39).

(3) With regard to claim 10, claim 10 inherits all the limitations of claim 8.

Ramaswamy further discloses in (Fig. 2 (210, 220)) wherein said plurality of constituent constellations consists of two constituent constellations (col. 2, lines 66-67, col. 3, lines 1-10, col. 4, lines 5-15, col. 5, lines 20-23).

(4) With regard to claim 11, claim 11 inherits all the limitations of claim 8.

Ramaswamy further discloses (Fig. 2 (210, 220)) wherein said plurality of constituent constellations consists of two square constituent constellations (col. 1, lines 32-39, col. 3, lines 1-10, col. 4, lines 5-15, col. 5, lines 20-23).

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1, 3-6, 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ramaswamy (US Patent 5,966,412) as applied to claim 8, in view of How (US Patent 5,396,518).

(1) With regard to claim 1, Ramaswamy discloses a method in a transmitter of a communications system, comprising: mapping a data stream to symbols of a symbol constellation to produce a symbol stream; modulating a signal in accordance with the symbol stream; and transmitting the modulated signal, wherein the symbol constellation comprises a plurality of constituent constellations each having independent I and Q mapping (col. 1, lines 7-31, col. 4, lines 5-14, 18-24).

However Ramaswamy does not disclose wherein mapping the data stream to symbols of the symbol constellation comprises selecting constituent constellations and selecting I and Q values within the selected constituent constellations in accordance with the data stream.

However How discloses wherein mapping the data stream to symbols of the symbol constellation comprises selecting constituent constellations and selecting I and Q values within the selected constituent constellations in accordance with the data

stream (col. 3, lines 6-41, col. 4, lines 3-10, col. 5, line 68, col. 6, lines 1-2, 7-15, col. 13, lines 2-10).

Therefore it would have been obvious to one of ordinary skill in the art to modify Ramaswamy in view of How to incorporate mapping the data stream to symbols of the symbol constellation comprises selecting constituent constellations and selecting I and Q values within the selected constituent constellations in accordance with the data stream to improve robustness of digital transmission against additive noise and reduce the coding gain requirement for trellis code modulation when concatenated with an outer code (How, col. 2, lines 4-5, 66-67).

(2) With regard to claim 3, claim 3 inherits all the limitations of claim 1. Ramaswamy further discloses wherein the constituent constellations are square in order to carry more information (col. 1, lines 32-39).

(3) With regard to claim 4, claim 4 inherits all the limitations of claim 1. Ramaswamy further discloses in (Fig. 2 (210, 220)) wherein said plurality of constituent constellations consists of two constituent constellations (col. 2, lines 66-67, col. 3, lines 1-10, col. 4, lines 5-15, col. 5, lines 20-23).

(4) With regard to claim 5, claim 5 inherits all the limitations of claim 1. Ramaswamy further discloses (Fig. 2 (210, 220)) wherein said plurality of constituent constellations consists of two square constituent constellations (col. 1, lines 32-39, col. 3, lines 1-10, col. 4, lines 5-15).

(5) With regard to claim 6, claim 6 inherits all the limitations of claim 1. Ramaswamy further discloses wherein said plurality of constituent constellations

consists of two square constituent constellations of equal size, and wherein said constituent constellations are offset from one another by one half spacing in the I and Q dimensions within said symbol constellation (col. 1, lines 45-53).

(6) With regard to claim 12, claim 12 inherits all the limitations of claims 8 and 6.

(7) With regard to claim 13, claim 13 inherits all the limitations of claim 8. How further discloses in (Fig. 2) a receiver for a communication system, comprising: at least one processor (34, 46); and storage media (38) coupled to the at least one processor and having stored therein programming instructions for generating a received data stream from a demodulated signal (29) representing a symbol stream generated by mapping a transmit data stream to symbols of a symbol constellation (Fig. 1 (28)), wherein the symbol constellation (Fig. 5) comprises a plurality of constituent constellations each having independent I and Q mapping (col. 3, lines 6-41, col. 4, lines 3-10, col. 5, line 68, col. 6, lines 1-2, 7-15, col. 13, lines 2-10, col. 15, lines 30-37).

How does not explicitly discloses a demodulated signal. However it is well known in the art that a signal that is modulated in the transmitter is inherently demodulated in the receiver.

### ***Allowable Subject Matter***

8. Claim 2 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The following is a statement of reasons for the indication of allowable subject matter: The instant application discloses a method for



using multi-dimensional constellations for soft-decision extraction. Prior art references show similar methods but fail to teach: **“wherein said mapping comprises: selecting a constituent constellation in accordance with a first group of transmit data bits; selecting an I value in accordance with a second group of transmit data bits; and selecting a Q value in accordance with a third group of transmit data bits”**, as in claim 2.

### ***Conclusion***

9. The prior art made record of and not relied upon is considered pertinent to applicant's disclosure:

a. Frenkel et al. US Patent 6,721,373 discloses a multi-tone receiver and a method for operating the same.

b. Wei US Patent 5,105,442 discloses coded modulation with unequal error protection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cicely Ware whose telephone number is 571-272-3047.

The examiner can normally be reached on Monday – Friday, 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on 571-272-3056. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9314 for regular communications and 703-872-9314 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

*Cicely Ware*

cqw  
February 15, 2005

A handwritten signature in black ink, appearing to read "Amanda T. Le". The signature is fluid and cursive, with a large initial "A" and a stylized "L".

**AMANDAT. LE**  
**PRIMARY EXAMINER**